An Online Model of International Clinical Mentoring for Novice Physical Therapists

Westervelt, Karen; Hing, Wayne A; McGovern, Mary Claire; Banks, Lora; Carney, Carolyn; Kunker, Katrina; Magoon, Ashley; Sibold, Jeremy; Crane, Linda H

Published in:
Journal of Manual and Manipulative Therapy

DOI:
10.1080/10669817.2018.1447789

Cover Page

Title:

An Online Model of International Clinical Mentoring for Novice Physical Therapists

Abstract word count: 247 words

Manuscript word count: 3599 words

Level of evidence: 1b

Keywords: Mentoring, Physical Therapy, online, spinal pain, confidence, postprofessional education, novices, clinical decision making

Sources of funding: None

Declaration of interest: The authors report no declarations of interest.

Abstract

Objectives: Clinical mentoring is important for novice clinicians as they are developing advanced critical thinking skills. Research exploring innovative mentoring strategies to reduce barriers and enhance learning is needed. The purpose of this study was to examine the effects of providing online clinical mentoring to small international groups of novice clinicians treating patients with spinal dysfunction in the outpatient setting.

Methods: Eleven novice and four expert clinicians were allocated into small international groups. Four one-hour group video-conference mentoring sessions were held in which each novice clinician presented a case study. Data were collected from pre- and post-participation surveys and post-participation focus groups. Data were evaluated with a mixed-methods phenomenological analysis.

Results: Four themes emerged from the novice qualitative data: improved confidence, enhanced critical thinking, appreciation of the structured design and accessibility to peers and mentors. The quantitative data revealed significant improvement in three confidence measures, improvement of 1.48 points on self-selected clinical goals, and 82.0% reported improved clinical decision-making. Two themes emerged from the expert data: value of the model to fill a need within the profession and viability of the model to stand alone or as part of an educational program. All participants rated their experience on average at 8.76/10 and expressed interest in future mentoring programs.

Discussion: Online small group international clinical mentoring appears to be an effective strategy to provide clinical mentoring to promote confidence and critical-thinking skills. This research could provide a viable model to increase accessibility to clinical mentors and fill a need within the profession.

Introduction

Clinical mentoring is an important component of postprofessional education in physical therapy and other professions.[1] Clinical mentoring is particularly important for novice physical therapists (PTs) who are still developing their skills and face insecurity with challenging patients.[2] It has been shown to benefit novice PT clinical decision making in acute care, pediatric, and inpatient rehabilitation settings.[3–5] Furthermore, recent research has identified the desire for mentorship to be universal in two regions of the world and that PTs viewed access to a mentor as a primary reason for wanting to obtain more education.[6] For new PTs, the first few years of practice is a time for "continued development of professional identity, knowledge base, clinical reasoning and decision-making skills".[7] Physical Therapists experience stress and insecurity transitioning from student to practitioner.[8] These feelings can be mitigated by the introduction of a clinical mentor. Mentors can help the novice PTs adapt to their new position[9] which is ultimately important for job satisfaction and retention within the profession.[1] Physical Therapists in their first year of practice focus on learning in context, expansion of skills, and gaining confidence; while those in their second year of practice still focus on increasing confidence, as well as engaging in collaborative exchanges with colleagues on complex cases.[7] At both stages, PTs benefit from mentoring, even if they may focus on different aspects of practice.[5]

Though there exists a clear desire among novices to obtain postprofessional education, including mentoring, several obstacles limit PTs from continuing their training.[2] In Australia, Canada and the United States, the most prevalent barriers to obtaining postprofessional education identified include lack of access due to geographical location, high costs, and a lack of time.[6,10] One way clinicians can access mentoring in the USA is through a formal postprofessional residency program. These programs are designed to promote skill acquisition and to advance

clinical decision making skills, thereby propelling a therapist from a novice to a clinical specialist.[7] However, residencies are costly, often require relocation and take time; as a result, the majority of clinicians do not receive postprofessional education following graduation.[6]

With technology advances and globalization of physical therapy education, new innovative solutions are available that could overcome these barriers. Online mentoring exists in many models including emailing, video conferences, and document sharing. Benefits of online mentoring can include quick responses, no location restriction, and lower costs.[11] Online mentoring has been implemented in a variety of health care professions, including nursing and medicine.[12–15] Online mentoring offers the additional possibility of international education.[16,17] International online mentoring through video-conferencing has already been shown to be highly effective at preparing nursing students for diverse learning environments and global interactions,[18] but has yet to be studied in the physical therapy profession.

International collaboration is valuable and prepares clinicians to work in an increasingly global environment. Fostering international collaborations in physical therapy can facilitate knowledge translation, prevent repeated experiments, and improve quality of care around the world.[19] International collaborations have also been rated as a highly effective teaching strategy[20] and are promoted in entry level curricula by the Commission on Accreditation in Physical Therapy Education.[21] Lattanzi et al. further identified video-conferencing as one of the main ways Doctor of Physical Therapy (DPT) programs currently prepare students to be globally aware and recommended more research into the best methods to promote collaboration.[16] Little research has been done to support the use of similar international learning opportunities for practicing novice clinicians.

Modern technology and globalization within educational settings can facilitate the development of new models of delivering clinical mentoring that can better meet the needs of today's clinicians around the globe. There has been a recent call in the literature for educational research in physical therapy,[22] and research examining the effectiveness of educational interventions to promote professional development.[23] Therefore, research exploring innovative clinical mentoring strategies to reduce barriers and enhance professional development is needed. In response to this call, the objectives of this research were to examine the feasibility and the effects of providing online clinical mentoring to small groups of international PTs treating patients with spinal dysfunction in an outpatient musculoskeletal setting.

Methods

Human research ethics committees in the United States of America (USA) and in Australia (AUS) approved this study. Sixteen participants were involved, including 4 clinical experts and 12 novices. To minimize variability of the mentors, 5 clinical experts were selected and invited to participate based on their level of clinical and teaching skills. All invited clinical experts had completed a postgraduate diploma or above from the same University in New Zealand in Spinal Manipulation, had more than 20 years of clinical experience in an outpatient musculoskeletal setting, and had teaching experience at both the entry level and postprofessional level of PT education. Of the 5 clinical experts invited to participate, 5 accepted and participated in the study; the Primary Investigator (PI)was one such participant, as is common in phenomenological studies.[24] Educational background and teaching experience combined with participation in an online training session with the PI prepared mentors and familiarized mentors with the protocol, procedure and expectations.

Email invitations were sent out to the 2 most recent years of alumni from one Australian and one United States Doctor of Physical Therapy (DPT) program to recruit novice clinicians. Email contact lists were obtained from academic directors at both universities. Recruitment letters were emailed to both groups of alumni a total of 3 times. Interested clinicians replied via email directly to the PI, were screened for eligibility, and the first 12 novices to meet the inclusion and exclusion criteria (Appendix 1) were accepted into the study upon completion of informed consent.

This was a phenomenological, mixed-methods study. Participants were assigned to mentoring groups according to availability. Groups consisted of one clinical expert and an international group of 3 novices. Over 6 weeks, 4 1-hour group clinical mentoring sessions were held using Blackboard Collaborate video conferencing system.[25] Case studies focusing on patients with spinal dysfunction were presented by the novice clinicians during each video conference call. Novices chose challenging cases from their current patients and shared an outline with all members of the group 2 days prior to the conference call. This case study, group discussion format was used to promote learning through collaboration.

Figure 1 summarizes methods and data collection in this study. Data from the clinical experts were collected from a pre-participation survey, a post-participation survey, and a post-participation focus group discussion. Data from novices were collected through 2 pre-participation surveys, one post-participation survey, and a post-participation focus group discussion. The second pre-participation survey was administered one week after the first. It consisted solely of the two scales described below, and was used to assess test-retest reliability.

The two scales utilized in this study were adapted from existing and validated outcome measures. The Clinician Confidence Questionnaire for Patients with Spinal Pain was based on

the self-efficacy questionnaire used in a study on rural pediatric clinicians in Australia.[26] The question items were modified to assess skills required for PTs working in an outpatient musculoskeletal setting treating patients with spinal pain. The scale was also changed from a five-item ordinal scale to a ten-point Likert scale, which better approximates a continuous linear variable and allows for parametric analysis.

The Clinician-Specific Outcome Scale was based on the Patient Specific Functional Scale (PSFS)[27] and modified to be relevant for a clinician establishing goals related to skills that can be improved through mentoring. The PSFS has been shown to be a reliable measure and was initially developed to assess the global construct of perceived level of disability in patients with several different types of musculoskeletal impairments.[28] The Clinician-Specific Outcome Scale was similarly developed to give novices an opportunity to identify personally relevant skills to self-evaluate and focus on improving through their participation in this mentoring program.

Members of the research team facilitated novice focus group discussions for each group without the clinical experts present. One focus group was also held with all 4 clinical experts. Audio recordings were made from the focus group discussion, which were then transcribed and analyzed phenomenologically.

Prior to study implementation, the survey questions and focus group questions for both novices and experts were reviewed by four senior research academics to ensure content validity. Changes were made as recommended by these reviewers. All surveys were then administered on Lime Survey.[29] Each survey was sent via a closed hyperlink that could only be accessed by the invited participants.

Results

Twelve novices were recruited; one left the study due to computer technical issues that inhibited participation. The sample size for pre- and post-intervention surveys was therefore 11. Out of the 11 participants, only 10 completed the second test-retest survey prior to the study. Test-retest reliability of the Clinician Confidence Questionnaire for Patients with Spinal Pain was assessed by paired t-test and Pearson's correlation; 9 of the 13 questions were found to have no significant differences between the test-retest administrations, while 4 were found to have significant differences limiting their usefulness (n=10). (Table 1)

To examine the effect of mentoring intervention on novices, the full administration of the survey was compared to the post-intervention survey. The novices' answers to the 13 questions of the Clinician Confidence Questionnaire for Patients with Spinal Pain were evaluated independently via paired t-test. Three of the questions showed significant improvement (Table 2). Hierarchal linear regression was used to determine whether categorical variables were significant predictors of novice outcomes on the Clinician Confidence Questionnaire for Patients with Spinal Pain. Categorical variables examined included gender, year of graduation, USA or AUS alumni, primary practice setting (rural, suburban, or urban), % of clinical patients with spinal pain, and whether or not physical therapy was a participant's first career. These variables were selected because all groups within them were greater than, or equal to, n=3. No variables were found to significantly change the model, indicating that the effects were not limited to a subset of participants.

Comparison of pre- and post-intervention scores on the Clinician Specific Outcome Scale revealed that participants improved an average of 1.48 points across all self-selected goals (SD=1.22). When each participant's three goals were analyzed, novices improved significantly (p=.010, .002, and .002, respectively) (see Table 2). Every novice improved in at least one goal,

except for one who stayed the same on all three. The remaining post-intervention survey questions asked novices about overall impressions of the experience and opinions on postprofessional education following the intervention. Responses are summarized in Table 3.

Researchers read the transcripts from all 4 group discussions and the narrative responses from the survey questions and analyzed them for common themes. Five researchers independently identified the main themes before reviewing them as a group. Seven themes were identified by researchers from the novice focus groups. After discussion, researchers came to a consensus on the 4 strongest themes: confidence, critical-thinking, accessibility, and structured design (Table 4). Qualitative study rigor was assured through achievement of fittingness, credibility, audibility, and saturation of the data (Figure 2). Qualitative and quantitative data from novices aligned and are triangulated in Figure 3.

All expert participants completed the post participation survey; results are summarized in Table 3. The expert focus group discussion transcript was analyzed. Researchers initially identified 13 themes from the single mentor focus group transcript. Transcripts were re-evaluated by the 5 researchers independently and 2 broader themes were agreed upon: viability and value of the model: fills a need (Table 4). Qualitative and quantitative data from experts aligned and are triangulated in Figure 3.

Discussion

In response to the recent call from the American Council of Academic Physical Therapy Tack Force on Education Research,[22] the authors designed and tested a model of online international clinical mentoring for novice PTs who work in an outpatient musculoskeletal setting. Results from this research demonstrated that both novices and experts benefited from

their involvement in this program and it is a viable model for post-professional mentoring in this setting. The qualitative themes that emerged from the data aligned with the quantitative findings and informed an understanding of the participants' overall experience.

The theme of "confidence" reflected the novices' improved self-efficacy in the clinic. Participants felt that the opportunity to discuss cases with peers was particularly effective at reinforcing what they are already doing well. One participant stated that she benefited from being able to "…see how they are doing and see how I'm doing and know that I'm on the right track, personally, I think that validation of being able to bounce ideas off of each other and really (helps me to) know that I'm doing the best I can at this point with my clinical knowledge for my patients."(Novice 4) These reflections were supported by the increases in confidence found on the four items of the Clinician Confidence Questionnaire for Patients with Spinal Pain and the improvements on their self-selected goals.

Having confidence is a key step towards being a successful independent practitioner,[30] and as direct access to physical therapy becomes more prevalent, clinicians around the world will need to confidently demonstrate advanced clinical decision making with a wide variety of patients.[31] The novices from both countries reported needing confidence, with one novice saying, "most new clinicians, despite where they have received training, will need to overcome their own insecurities as new therapists. Building confidence seems to be an important theme as a new clinician." (Novice 4)

Novices also emphasized that they were particularly more confident in clinical-decision making in the clinic, which was one part of the overall theme of "critical thinking." In addition to collecting and analyzing data in the clinic, critical thinking also encompassed the broadening of perspective that many novices experienced. Previous studies have found that experience alone is

not sufficient in increasing clinical decision making, but reflection is essential.[5,7,30] The case-study format of mentoring sessions in this study exposed novices to new viewpoints, which promotes reflection on previous knowledge and thinking processes while expanding repertoire for treatments.

This theme was also supported by novice responses on final surveys, where they reported gaining "improved clinical decision making" and "new ideas for treatment." In addition, the three items on the Clinician Confidence Questionnaire for Patients with Spinal Pain that novices showed significant improvement, arguably, involve more critical thinking. This may reinforce the impact of this program on novices' perception of their problem-solving abilities.

Accessibility referred to novices' appreciation for the way the model allowed them to access a mentor. Novices in this study found that this online mentoring model provided solutions to overcome many of the identified barriers related to access. Specifically, the model required minimal time commitment, allowed for flexible schedules, and eliminated the need for costly travel. This experience enabled clinicians to communicate with individuals in their own country as well as opened the door for international collaboration and sharing of ideas. One participant stated, "I just think that it makes it a little bit more interesting to see what people internationally are doing…" (Novice 9)

Availability and access to support and opportunities for professional growth often influence a practitioner's decision to relocate to, stay in, or leave a rural community.[32] Lack of support in rural areas can be especially intimidating for novices. The model presented here therefore holds particular promise for benefitting clinicians in rural areas, where few opportunities exist to collaborate with other professionals. One participant noted, "We have a lot of rural places… When you go out to those sorts of places you have to be everyone. You don't

have a lot of support in those areas, so I think something like this would just be invaluable."(Novice 3) Providing online mentoring could lessen some of the challenges in recruiting and retaining clinicians in rural practice locations.

Novices appreciated many aspects of the program's structured design. They emphasized that the regular, formal nature of the mentoring and components including the video-format, the case studies, and the inclusion of diverse participants, enhanced their experience. Many noted that, although they may have colleagues in their clinic that they confer with about complex cases, scheduling and day-to-day demands do not always allow for informal mentoring or collaboration. The regular, scheduled time to reflect, discuss, and learn new concepts was therefore highly valued among novices. Previous research suggests that novices in their first two years move from needing reinforcement of basic skills to desiring more opportunities to discuss patient cases with peers or mentors.[5,7] The group structure of the mentoring sessions applied this theory and added an important element to traditional 1:1 mentoring by allowing these new PTs to bounce ideas off of others in a low-pressure environment, with an expert present to provide guidance.

Experts reported that this online distance-mentoring model was very effective as a stand-alone model. They also suggested many other possible applications of the model, including using it to supplement continuing education classes. Clinicians could elect to receive online mentoring following a face-to-face continuing education class in order to promote a change in clinical practice patterns. Another application for this model would be to increase intra-and inter-professional international collaborations. These types of collaborations could encourage clinicians to develop global perspectives in healthcare, help to unite the profession internationally and promote shared knowledge and resources. One expert felt this model could be

useful in academic settings to help address the rising difficulty of finding clinical placements. A postgraduate student could work in a clinic of their choosing, and mentoring could be provided remotely by a faculty member or associated clinician who is intimately aware of the postgraduate curriculum and learning objectives to facilitate more standardized learning.

Expert clinicians found great value in this experience for novices, for themselves as mentors, and for the profession as a whole. Experts particularly felt that supporting the transition from students to independent practitioners through mentoring could raise overall standards of practice. Novice responses to the final survey confirmed expert perception of value. All novices reported that the mentoring sessions changed the way they treated their patients and that participating in a mentoring program like this one would have "long term clinical implications" for them, indicating both perceived immediate value gained and potential for career-long benefits.

Despite great clinician interest in residency programs in the USA, multiple barriers exist to these and other academic postprofessional programs that can make them inaccessible to many. Clinical experts agreed that online clinical mentoring could be viable as a standalone model or as an addition to an existing program. Both applications promote opportunities for clinicians seeking to advance within the profession who lack financial or geographical access to formal postprofessional programs.

This model also filled a need by generating a forum in which international collaboration and dialogue may occur. One expert clinician stated "[International collaboration] added to the richness of the conversation and the similarities in issues faced by clinicians around the world was very interesting. Models such as this can really help to strengthen the profession globally." (Expert 101)

Lastly, expert clinicians also expressed an interest in having their own mentors, and noted that when faced with a complicated patient, they still relied on collaboration with other colleagues to think about the case and discover new treatment ideas. The desire for collaboration does not end with experience. Experienced clinicians appear to have acknowledgment of the importance of mentoring and professional collaboration.

This study utilized a small sample of PTs from only 3 countries, and provided intervention over a relatively short time period of 6 weeks to all participants, with no control group for comparison. Novices were graduates from either a DPT program in AUS or the USA. Educational training appeared comparable, providing for ease of case-based discussions amongst all novices. Due to the small sample size and similarity of programs, it is unknown if this model would perform as well if the members of the group came from very different educational backgrounds.

Participants for this study voluntarily responded to an invitation letter, which could introduce a selection bias. This was confirmed in responses to the survey where all novices noted that they were “somewhat interested” or “very interested” in postprofessional education.

Future research is recommended to see if this model of international online distance clinical mentoring in small groups could support other groups of PTs including clinicians working in remote settings. This research helps create a foundation for a model of delivery for clinical mentoring. Future research is needed to examine if this model can promote advanced clinical reasoning for PTs in post professional educational programs. Ultimately, future research is need to tract patient outcomes to help determine the effects of mentoring on clinic practice.

Conclusion

This model of international online small group clinical mentoring appears to be an effective model to provide needed support for novices in their first 2 years of practice. This is a period of rapid professional growth as one transitions from being a student to novice clinician to a confident independent practitioner. This model may help build confidence and promote advanced critical thinking skills that are needed to work with complex patient populations such as patients with spinal pain. Distance clinical mentoring is a model that alleviates some of the most commonly reported barriers to obtaining postprofessional education, specifically cost and accessibility. International online mentoring can open up opportunities for international collaborations encouraging a sharing of resources and ideas around the world as we work in a truly global health care arena. Ultimately, as emphasized by Jensen et al, "the profession has a moral obligation to prepare clinicians, educators, and future researchers to meet the health care needs of clients, society and the communities in which people live." [22(p1883)] This research provides a viable model to increase accessibility to clinical mentoring and fill a need within the profession.

References

[1] Ragins BR, Kram KE. The roots and meaning of mentoring. Handb. Mentor. Work Theory Res. Pract. 2007;3–15.

[2] Di Vito-Thomas PA. Barmentoring: Mentoring and critical nursing behaviors among novice nurses in clinical nursing practice. Medsurg Nurs. 1998;7:110–113.

[3] Carthas S, McDonnell B. The development of a physical therapy mentorship program in acute care. J. Acute Care Phys. Ther. 2013;4:84–90.

[4] Stewart S, Carpenter C. Electronic mentoring: An innovative approach to providing clinical support. Int. J. Ther. Rehabil. 2009;16:199–206.

[5] Wainwright SF, Shepard KF, Harman LB, et al. Factors That Influence the Clinical Decision Making of Novice and Experienced Physical Therapists. Phys. Ther. 2011;91:87–101.

[6] Westervelt K, Chenette J, Merkel L, et al. Postprofessional Physical Therapy Education: A Survey from Two Different Regions of the World. J. Phys. Ther. Educ. 2017;under review:1–29.

[7] Hayward LM, Black LL, Mostrom E, et al. The First Two Years of Practice: A Longitudinal Perspective on the Learning and Professional Development of Promising Novice Physical Therapists. Phys. Ther. 2013;93:369–383.

[8] Duchscher JEB. Transition shock: the initial stage of role adaptation for newly graduated Registered Nurses. J. Adv. Nurs. 2009;65:1103–1113.

[9] Solomon P, Miller PA. Qualitative Study of Novice Physical Therapists' Experiences in Private Practice. Physiother. Can. 2005;57:190–198.

[10] Sran MM, Murphy S. Postgraduate Physiotherapy Training: Interest and Perceived Barriers to Participation in a Clinical Master's Degree Programme. Physiother. Can. 2009;61:234–243.

[11] Lipscomb R. Instant Mentoring: Sharing Wisdom and Getting Advice Online with E-Mentoring. J. Am. Diet. Assoc. 2010;110:1148–1155.

[12] Harris R, Birk SB, Sherman J. E-Mentoring for Doctor of Nursing Practice Students: A Pilot Program. J. Nurs. Educ. 2016;55:458–462.

[13] Masny A, Ropka ME, Peterson C, et al. Mentoring Nurses in Familial Cancer Risk Assessment and Counseling: Lessons Learned From a Formative Evaluation. J. Genet. Couns. 2008;17:196–207.

[14] Pindyck T, Kalishman S, Flatow-Trujillo L, et al. Treating hepatitis C in American Indians/Alaskan Natives: A survey of Project ECHO® (Extension for Community

Healthcare Outcomes) utilization by Indian Health Service providers. SAGE Open Med. [Internet]. 2015 [cited 2016 Sep 18];3. Available from: https://www-ncbi-nlm-nih-gov.ezproxy.uvm.edu/pmc/articles/PMC4679318/.

[15] Wood BR, Unruh KT, Martinez-Paz N, et al. Impact of a Telehealth Program That Delivers Remote Consultation and Longitudinal Mentorship to Community HIV Providers. Open Forum Infect. Dis. 2016;3:ofw123.

[16] Lattanzi JB, Pechak CM. Educating Globally Minded Physical Therapist Students: Curriculum Strategies to Equip the Next Generation. J. Phys. Ther. Educ. 2012;26:55–60.

[17] Plummer CA, Nyang'au TO. Reciprocal e-mentoring Accessible international exchanges. Int. Soc. Work. 2009;52:811–822.

[18] Daley LK, Spalla TL, Arndt MJ, et al. Videoconferencing and Web-based conferencing to enhance learning communities. J. Nurs. Educ. 2008;47:78–81.

[19] Wees PJV der, Moore AP, Powers CM, et al. Development of Clinical Guidelines in Physical Therapy: Perspective for International Collaboration. Phys. Ther. [Internet]. 2011 [cited 2016 Dec 14]; Available from: http://ptjournal.apta.org/content/early/2011/07/28/ptj.20100305.

[20] Westervelt K, Ellis C, Ellis L, et al. International Collaboration in Manual Physical Therapy: An Educational Model. J. Phys. Ther. Educ. 2016;30:44–54.

[21] Commission on Accreditation in Physical Therapy Education. Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists. American Physical Therapy Association; 2014.

[22] Jensen GM, Nordstrom T, Segal RL, et al. Education Research in Physical Therapy: Visions of the Possible. Phys. Ther. 2016;96:1874–1884.

[23] Yeung E, Woods N, Dubrowski A, et al. Establishing assessment criteria for clinical reasoning in orthopedic manual physical therapy: a consensus-building study. J. Man. Manip. Ther. 2015;23:27–36.

[24] Ehrlich GE. Low back pain. Bull. World Health Organ. 2003;81:671–676.

[25] Blackboard Collaborate. 2010.

[26] Minisini M, Sheppard LA, Jones A, et al. Self-efficacy beliefs and confidence of rural physiotherapists to undertake specialist paediatric caseloads: a paediatric example [Internet]. Australian Rural Health Education Network; 2010 [cited 2016 Oct 17]. Available from: http://www.rrh.org.au/articles/printviewnew.asp?ArticleID=1426.

[27] Horn K, Jennings S, Richardson G, et al. The patient-specific functional scale: psychometrics, clinimetrics, and application as a clinical outcome measure. J. Orthop. Sports Phys. Ther. 2012;42:30–42.

[28] Stratford P, Gill C, Westaway M, et al. Assessing Disability and Change on Individual Patients: A Report of a Patient Specific Measure. Physiother. Can. 1995;47:258–263.

[29] Lime Survey. 2003.

[30] Black LL, Jensen GM, Mostrom E, et al. The First Year of Practice: An Investigation of the Professional Learning and Development of Promising Novice Physical Therapists. Phys. Ther. 2010;90:1758–1773.

[31] Wainwright SF, Shepard KF, Harman LB, et al. Novice and Experienced Physical Therapist Clinicians: A Comparison of How Reflection Is Used to Inform the Clinical Decision-Making Process. Phys. Ther. 2010;90:75–88.

[32] Moran AM, Coyle J, Pope R, et al. Supervision, support and mentoring interventions for health practitioners in rural and remote contexts: an integrative review and thematic synthesis of the literature to identify mechanisms for successful outcomes. Hum. Resour. Health. 2014;12:10.

Table 1. Test-Retest Analysis of the Clinician Confidence Questionnaire for Patients with Spinal Pain *(n=10)*

Question	Mean difference of pre-intervention 1 – pre-intervention 2	SD	95% CI	t (p)	r (p)
1 (n=10)	0.091	0.700	-0.38 – 0.562	0.430 (0.676)	0.800 (0.003)**
2 (n=10)	-0.182	0.874	-0.769 – 0.405	0.690 (0.506)	0.859 (0.001)**
3 (n=10)	-0.091	1.136	-0.854 – 0.672	-0.265 (0.796)	0.746 (0.008)**
4 (n=10)	0.636	0.809	0.093 – 1.180	2.609 (0.026)*	0.802 (0.003)**
5 (n=10)	0.000	1.183	-0.795 – 0.795	0.000 (1.00)	0.676 (0.022)*
6 (n=10)	0.636	0.809	0.093 – 1.180	2.609 (0.026)*	0.835 (0.001)**
7 (n=10)	0.545	1.440	-0.422 – 1.513	1.257 (0.237)	0.563 (0.071)
8 (n=10)	0.000	1.183	-0.795 – 0.795	0.000 (1.00)	0.732 (0.011)*
9 (n=10)	0.364	1.027	-0.326 – 1.054	1.174 (0.267)	0.856 (0.001)**
10 (n=10)	0.455	1.128	-0.303 – 1.212	1.336 (0.211)	0.541 (0.086)
11 (n=10)	0.273	1.009	-0.405 – 0.951	0.896 (0.391)	0.695 (0.018)*
12 (n=10)	0.000	0.633	-0.425 – 0.425	0.000 (1.00)	0.909 (<0.001)**
13 (n=10)	0.182	0.603	-0.223 – 0.587	1.000 (0.341)	0.978 (<0.001)**

* = $p < .05$

** = $p < .01$

Table 2. Pre-Post Intervention Analysis of the Clinician Confidence Questionnaire for Patients with Spinal Pain and Clinician-Specific Outcome Scale

Question	Mean difference of post-intervention – pre-intervention 1	SD	95% CI	t	p
CCQPSP 1 (n=11)	0.700	1.252	-0.195 – 1.595	1.769	0.111
CCQPSP 2 (n=11)	0.700	1.703	-0.518 – 1.918	1.300	0.226
CCQPSP 3 (n=11)	0.900	1.449	-0.137 – 1.937	1.964	0.081
CCQPSP 4 (n=11)	0.100	1.449	-0.937 – 1.137	0.218	0.832
CCQPSP 5 (n=11)	0.700	1.337	-0.257 – 1.657	1.655	0.132
CCQPSP 6 (n=11)	0.600	1.350	-0.366 – 1.566	1.406	0.193
CCQPSP 7 (n=11)	1.000	1.414	-0.012 – 2.012	2.236	0.052
CCQPSP 8 (n=11)	0.400	1.897	-0.957 – 1.757	0.667	0.522
CCQPSP 9 (n=11)	1.100	1.449	0.063 – 2.137	2.400	0.040*
CCQPSP 10 (n=11)	0.800	1.476	-0.256 – 1.856	1.714	0.121
CCQPSP 11 (n=11)	1.100	1.370	0.120 – 2.080	2.538	0.032*
CCQPSP 12 (n=11)	0.800	1.549	-0.308 – 1.908	1.633	0.137
CCQPSP 13 (n=11)	1.400	1.776	0.129 – 2.670	2.492	0.034*
CSOS Goal 1 (n=10)#	1.400	1.350	0.434 – 2.366	3.280	0.010*
CSOS Goal 2 (n=10) #	1.300	0.949	0.621 – 1.979	4.333	0.002**
CSOS Goal 3 (n=10) #	1.800	1.317	0.858 – 2.742	4.323	0.002**

* = $p < .05$

** = $p < .01$

= n<11 due to one participant not assigning a numerical value of confidence to CSOS goals

Table 3. General Survey Results

Question	Novice Clinician Results (n=11)	Clinical Expert Results (n=4)
Please rank your interest in postprofessional PT/physiotherapy education. (5 = I am considering attending a postprofessional program, 4 = very interested, 3 = somewhat interested, 2 = a little interested, 1 = not interested)	2/11: somewhat interested (18.2%) 9/11: very interested (81.8%)	N/A
What barriers prevent you from obtaining postprofessional education?	11/11 "cost" (100%) 9/11 no benefit from employers perspective (81.8%) 7/11 "time away from work" (64.0%) 6/11 "access to the class I am interested in" (55.0%)	N/A
Please rate your overall impression of this experience. (1 = terrible, 5 = neutral, 10 = excellent)	Average of 8.3	Average of 9.3
Was the group size of 3 appropriate?	11/11 "yes" (100%)	N/A
Did participation in this project alter how you treated or would have treated the patient you discussed?	11/11 "yes" (100%)	N/A
What did you gain from participating in this research project? Select all that apply: increased awareness of international PT, improved clinical decision making, improved treatment session planning, new ideas for treatment, interest in attending more manual therapy education, other.	9/11 "improved clinical decision making" (81.8%) 10/11 "new ideas for treatment" (90.9%)	N/A
Was it useful to establish goals at the beginning of this project?	11/11 "yes" (100%)	N/A
Would you participate in a distance mentoring program again? (Yes, no, maybe)	10/11 "yes" (90.9%) 1/11 "maybe" (9.1%)	N/A
Do you feel your participation in a mentoring program such as this one will have long term practice implications for you?	11/11 "yes" (100%)	N/A
Was the group size of 3 appropriate?	11/11 "yes" (100%)	100% "yes"

In your opinion what would be the ideal total length of time for a mentoring program?	7.2 months range: 1-24 months	3.75 months 3- 3 months 1- 6 months
Would you have liked more training before starting?	9/11 “no” (81.8%)	100% “no”
In your opinion, did this model of clinical mentoring encourage a novice clinician to gain confidence and efficacy in his or her clinical practice?	9/11 “yes” (81.8%)	100% “yes”
Years experience	N/A	Average of 26.8 years 100% over 20 years experience
Do you believe you’d benefit from a mentor yourself?	N/A	100% “yes”

Table 4. Quotes & Themes

Novice Theme	Quotes
Confidence: **A sense of assuredness that the evaluation and treatment was appropriate and beneficial for the patient**	*"Just being able to share ideas and expand on your sort of thought process, I think that was just hugely valuable. I think there's an element of confidence that comes from doing things like this when you, sometimes, you do just need to see that other people are doing similar things as you, and that is of great value as well." (Participant #3)* *"The most valuable aspect for me was the chance to form this interaction with peers, people who are also recent graduates, and kind of see how they are doing and see how I'm doing and know that I'm on the right track." (Participant #4)* *"Our discussions made me more confident in my current skills and clinical decision-making. After this mentorship program I now have some goals for myself for this coming year." (Participant #5)* *"The most valuable outcomes, I would say, were the increased confidence in clinical decision making." (Participant #7)*
Critical Thinking **The ability to reflect upon and analyze information gathered**	*"I learned a lot more than just diagnosing and treating spinal pain. I learned clinical decision-making skills that have already helped my practice for many different patients." (Participant #5)* *"It's just nice to see other people's views of how they would attack an issue or would treat someone it's just having a different view so I can kind of get out of my own […] way of thinking of something and try to look at it a different way to help a patient." (Participant #8)* *"I had questions about patients – about a patient – and I was able to discuss them and come up with possible solutions and then test them out. It wasn't just theory based." (Participant #6)* *"(The most valuable outcome was)…collaboration with an expert and group members to provide new treatment ideas directly applicable and enhance clinical reasoning." (Participant #4)*

Access **Ease of access to a clinical mentor and peers at a similar stage of professional development**	*"It definitely provides a level support that most new grads are probably missing out on, especially if they are working in a private practice setting." (Participant #4)* *"It's just online, which is really nice. You don't have to leave your home. You don't have the cost of travel, which is so burdensome for most work that you do continuing education wise. Which is why this is just so great, and to come upstairs and talk to someone that has awesome skills." (Participant #9)* *"I just don't have anyone to sit down with for an hour and in depth discuss things. It's nice to have that structured time to be able to do that…having that access to someone's mind, where they're not thinking about a hundred different things while they're at work, they're here to focus with us, is just phenomenal for us being out so little into being PTs." (Participant #9)*
Structured Design **Perceived benefit from having a scheduled time and case study format for meeting with mentoring groups**	*"Particularly in the treating clinic, it's very hard to give yourself some time to think about reflecting, thinking about what you did right and wrong with patients…And a mentorship… having clear structured time to sit down and reflect…(is) beneficial." (Participant #11)* *"I liked how we rotated through and discussed a different topic every week…it really gave you something different every week to focus on." (Participant #4)* *"It was very enlightening to receive advice and feedback from other countries and understand how the variety in our schooling has lead to different ways to conceptualize and interpret the same clinical conditions." (Participant #5)* *"I ended up going back through a lot of the notes from our second orthopedics class and I started looking through the PowerPoints again." (Participant #4)* *"I think from the theoretical learning and decision making side of it you can really benefit greatly from the distance video chatting." (Participant #8)*

Table 4. Quotes & Themes Continued

Expert Theme	Quotes
Viable Model **A model that could be very effective on its own or as part of other education programs**	*"(This clinical mentoring model) could be beneficial for universities, associations or private organizations." (Participant #102)* *"I think that this is as valuable as a standalone package, but I think reinforces what we teach on our courses...it can only enhance that. And so, having it as a part of a bigger package as well is a logical sort of progression of it. But I don't think it has to be…I think I'd be happy to do the same thing as a standalone package." (Participant #104)* *"Mentoring, especially, is so good over the internet. Right, and all of us have said that that cross-continent sort of discussions has been really…it has been really fruitful." (Participant #102)* *"I think (this) provided something that many new practitioners could get a lot out of without a huge investment in time, or time away from the clinic." (Participant #103)* *"It's certainly very marketable to the up and coming professions in other countries, as well as something that could be used in universities or different associations or private stuff. Like you said, once you've done the practical you could then have the mentoring." (Participant #102)* *"Because that's where we're really falling down, in my mind. As far as, I take my weekend class, but I don't change my clinical practice. So, if this was part of a bigger model that was, you know, an online theory class, face to face class and then, by the way, you can also buy this clinical decision making section that goes on." (Participant #101)* *"Like it's just how, how applicable it is. It's exciting!" (Participant #102)*
Value of the model: Fills a Need **Beneficial to novice clinicians and the profession**	*"This model is extremely valuable to the remote/rural physiotherapist." (Participant #103)* *"If people come in, come out, and they go straight into their own business and then haven't got anyone mentoring them they're very average physios after a few years." (Participant #102)* *"I totally agree that if we're going to change practice, you need some sort of follow up… (Currently) It's a weekend course and then it is all over done with. And this would be a*

	great way of reinforcing those learnings." (Participant #104) *"One of the other things that I think is valuable to think about is that many times these novice practitioners have mentoring options, but it's within their work place. And they sometimes feel a little intimidated. They don't want to go ask the person who signs their pay check with this question, because, well, this person might not sign that pay check anymore because some of them are dumb questions." (Participant #103)* *"It's great. I mean, there's less and less people wanting to go and take massive amount of time off and do study. And…you don't want to lose that upper end of our profession." (Participant #102)*

Figure 1. Methods Flowchart

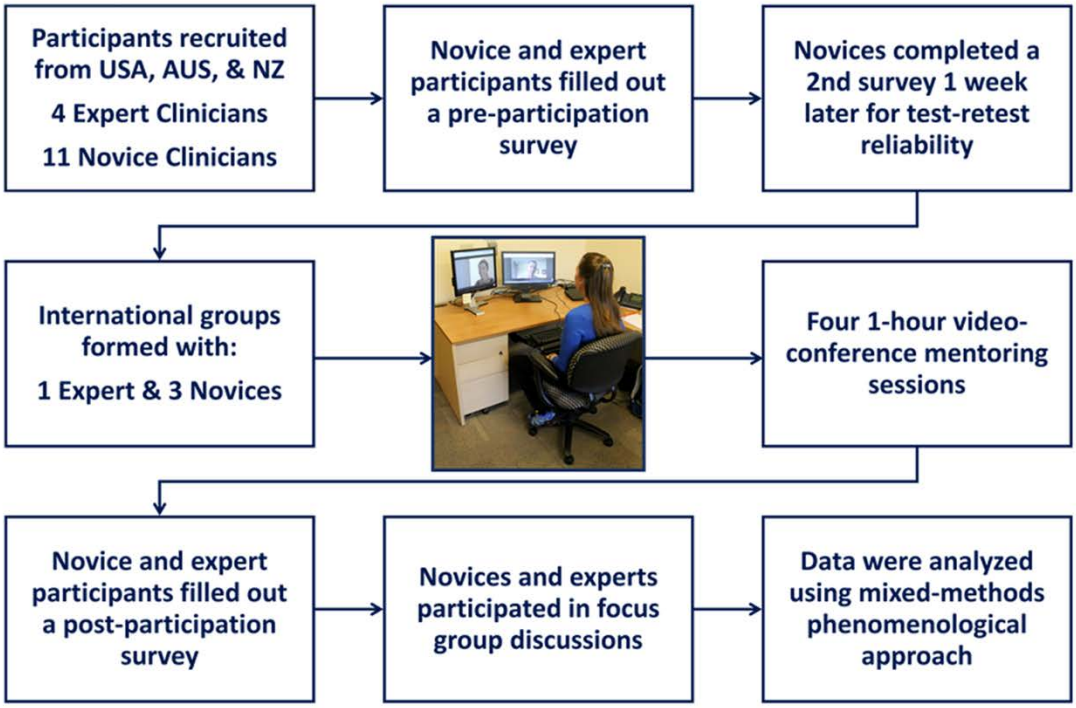
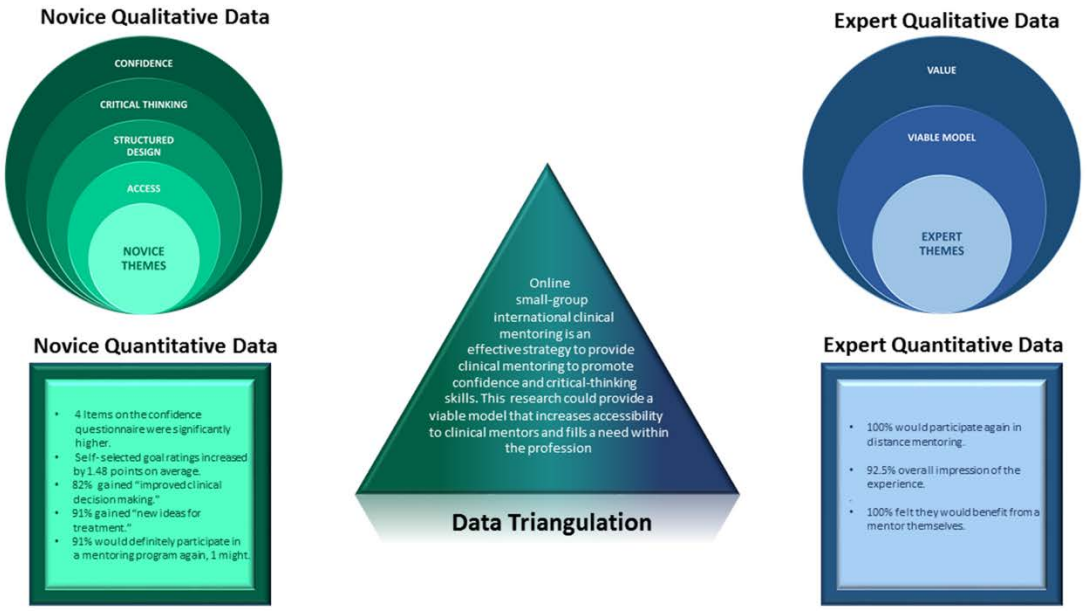


Figure 2. Rigor of Analysis

Figure 3. Data Triangulation



Appendix 1

Recruitment Eligibility Criteria

1. Physical therapist or Physiotherapist with less than 2 years of experience.
2. Presently working in an outpatient musculoskeletal setting 20 hours or more a week.
3. Treat patients with spinal pain on regular case load.
4. Philosophy of patient care is a general treatment approach including therapeutic exercise and manual therapy. Not a specialty focus of only using yoga, work hardening, McKenzie, or some other specialty focus.
5. Not enrolled in or completed a formal residency program or other program with formal clinical mentoring.
6. Have 4 hours of time (during a 6 week period) and could attend a video conference on the computer.
7. Have access to a computer with internet connection.
8. Available for morning or weekend mentoring sessions if living in the Southern Hemisphere. Available for evening or weekend mentoring sessions if living in the Northern Hemisphere.
9. Willing to complete pre and post online surveys about this mentoring experience.

Appendix 2

Clinician Confidence Questionnaire for Patients with Spinal Pain

1. I feel adequately prepared to undertake a caseload of patients with spinal pain.
2. I feel that I am able to verbally communicate effectively and appropriately with patients with spinal pain.
3. I feel that I am able to communicate in writing effectively and appropriately about the patients with spinal pain on my case load.
4. I feel that I am able to perform subjective assessments for my patients with spinal pain.
5. I feel that I am able to perform objective assessments for my patients with spinal pain.
6. I feel that I am able to interpret assessment finings appropriately for my patients with spinal pain.
7. I feel that I am able to identify and prioritize problems for my patients with spinal pain.
8. I feel that I am able to select appropriate short and long term goals for my patients with spinal pain.
9. I feel that I am able to appropriately perform treatments for my patients with spinal pain.
10. I feel that I am able to perform discharge planning for my patients with spinal pain.
11. I feel that I am able to evaluate my treatments for my patients with spinal pain.
12. I feel that I am able to progress interventions for my patients with spinal pain.
13. I feel that I am able to deal with the range of patient conditions which may be seen with the patients with spinal pain on my case load.

Appendix 3

Clinician-Specific Outcome Scale

Please identify three aspects of working with people with spinal pain that you would like to improve upon through participation in this clinical mentoring program. Rate your current ability in these areas from 0-10 (0 = unable to do; 10 = able to do consistently at an expert level).